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CONSERVATION, ENERGY EFFICIENCY AND GHGs: SOME QUESTIONS

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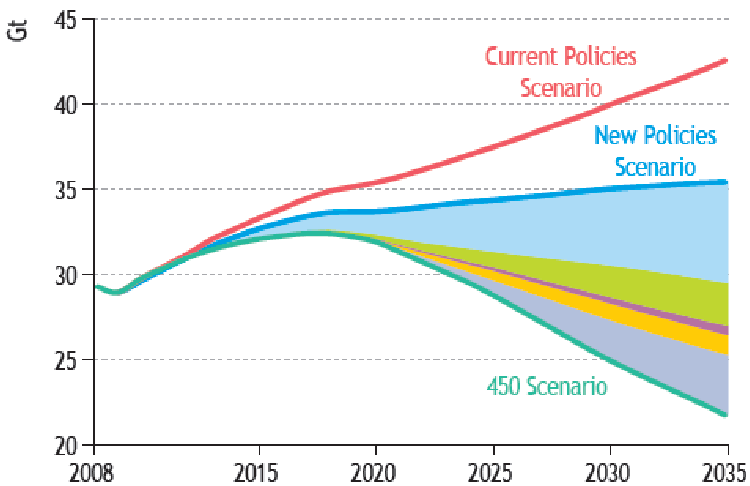
One aspect of the energy efficiency/rebound debate that has not been fully explored is the question of whether and to what extent reducing consumption today of non-renewable energy resources (such as petroleum) will simply postpone that consumption rather than permanently reducing it. For most of the last century, conservation policies were aimed at efficient production and use of oil and other non-renewable resources in order to ensure their availability for future generations. 1970s energy policy focused as much on “energy conservation” (i.e., reducing energy use through 55 MPH speed limit, lowering thermostats, etc.) as it did on energy efficiency (i.e., increasing MPG, high-efficiency refrigerators). Whether energy saved now would be consumed by future generations did not become an important question until policymakers looked to energy efficiency as a means of slowing the increase in atmospheric GHG concentrations. But once energy efficiency became a key component of climate policy, the question of permanence of reductions in fossil fuel use (from energy efficiency or other means) became highly relevant. In IEA’s 450 PPM scenario, for example, energy efficiency is the largest single wedge:

REDUCTIONS IN ENERGY-RELATED CO2 EMISSIONS – 450 PPM SCENARIO



	Abatement 2020	Abatement 2035
Efficiency	76%	43%
Renewables	14%	18%
Biofuels	2%	4%
Nuclear	4%	8%
CCS	3%	26%
Total (Gt CO_2)	1.8	13.7

Source: IEA World Energy Outlook 2010

Accordingly, even if we assume that energy efficiency actually reduces energy use after taking into account rebound effects, the question remains: Will fossil fuel left in the ground today nonetheless be produced at some later date when fossil energy is scarce and demand higher than today? And, from a climate policy point of view, will GHG emission reductions from today's energy efficiency policies merely postpone those emissions? What will the long-term impact be on GHG concentrations?

Similar question can be raised in the context of a fixed carbon tax, (will the tax merely postpone fossil fuel-related emissions), enhanced oil recovery utilizing anthropogenic CO_2 (will increased oil production from EOR displace production by conventional means), and biofuels (will displacing gasoline from the U.S. market lower prices and increase consumption and GHG emissions in other countries).

One answer to these questions might proceed from the simplistic notion that global fossil energy resources available for human consumption are fixed and that whatever is available will ultimately be used. Under this assumption, reducing consumption now will save non-renewable resources for future use and that future use will occur.

Current thinking on resource use is more nuanced because it doesn't regard the supply of oil or other fossil-fuels as a fixed stock. In the case of petroleum, we regard quantity of production to be a function of price – the prevailing view being that petroleum will continue to be available indefinitely at some price. In this context, the permanent reduction v. postponement issue raises a series of key questions (at least for non-economists):

- Focusing first on oil –
    - In the near-term, how will oil producers (who today are predominantly national oil companies) react to a reduction in demand from energy efficiency policies? Will they reduce output, keep output constant at a lower price, or even increase it in order to maintain revenues?
    - Assuming that energy efficiency measures result in a decrease in current global oil production, how will the existence of the unproduced oil reserves affect future supply costs and production? Does the answer depend on the longevity of the energy efficiency programs?

- Is the analysis for natural gas and coal different from that for oil?

- Assuming that energy efficiency measures postpone rather than permanently reduce GHG emissions, what is the value in the resultant near-term reduction in the rate of increase in GHG concentrations?